

CLAIMS

I claim:

1. Apparatus for delivering treated cooling air for cooling molds of a glass manufacturing machine, said apparatus comprising:
  - 5 a manifold for distributing treated cooling air to molds of a glass manufacturing machine;
  - a blower for delivering treated cooling air to said manifold;
  - an indirect heat exchanger for receiving untreated cooling air and for delivering treated cooling air to said blower, said indirect heat exchanger having a coil therein, said coil having an inlet and an outlet;
  - 10 a water cooling tower for cooling water used in a plant for manufacturing glass articles, said water cooling tower having a first water outlet for delivering water at a first temperature and a second outlet for delivering water at a second temperature, the second temperature being
  - 15 higher than the first temperature;
  - a pump for receiving water from at least one of the first outlet and the second outlet of said water cooling tower and for delivering water to said inlet of said indirect heat exchanger to flow through said coil of said indirect heat exchanger from said inlet to said outlet in indirect heat transfer
  - 20 relationship with untreated air flowing into said indirect heat exchanger;
  - a temperature controlled three-way mixing valve upstream of said coil of said indirect heat exchanger for receiving water from the first water outlet and the second water outlet and for controlling the treating effect of water delivered to said inlet of said indirect heat exchanger; and
  - 25 a return line for returning water from said outlet of said indirect heat exchanger to said water cooling tower.
2. Apparatus according to claim 1 wherein:
  - 30 said pump is positioned downstream of said mixing valve, said mixing valve serving to control the treating of air in said indirect heat exchanger by controlling the temperature of water flowing to said indirect heat

exchanger by controlling relative flow rates of water flowing from said first outlet and water flowing from said second outlet to said coil of said indirect heat exchanger.

5           3.   Apparatus according to claim 1 wherein:

              said pump is positioned upstream of said mixing valve, said mixing valve serving to control the treating of air in said indirect heat exchanger by controlling the volume of water flowing to said indirect heat exchanger, said mixing valve serving to receive water from one of said first  
10   outlet and said second outlet and for selectively delivering water from said pump to said coil of said indirect heat exchanger or for returning water from said pump to an inlet to said pump.

              4.   Apparatus according to claim 3 and further comprising:

15           a second indirect heat exchanger, said second indirect heat exchanger being positioned between said blower and said manifold for treating air received from said blower before air from said blower is received by said manifold.

20           5.   Apparatus according to claim 4 and further comprising:

              a water flow line from one of said first outlet and said second outlet of said water cooling tower to said inlet of said coil of said second indirect heat exchanger; and

              a temperature controlled flow control valve in said line from said  
25   water cooling tower to said second indirect heat exchanger for controlling the rate of the flow of water from said water cooling tower to said second heat exchanger.

              6.   The method of treating air for use in cooling molds of a glass  
30   manufacturing machine, the method comprising:

treating a stream of air by passing it through an indirect heat exchanger in indirect heat transfer relationship with a coil in the indirect heat exchanger;

5        passing treated air from the indirect heat exchanger through a blower;

delivering treated air from the blower to a manifold for delivering to molds of a glass manufacturing machine;

cooling water from a glass manufacturing plant in a water cooling tower;

10       removing water at a first temperature from a first outlet of the water cooling tower;

removing water at a second temperature from a second outlet of the water cooling tower; and

15       pumping water comprising water selected from the group consisting of water from the first outlet of the water cooling tower, water from the second outlet of the water cooling tower and a mixture of water from the first outlet of the water cooling tower and the second outlet of the water cooling tower to flow through the coil of the indirect heat exchanger to alter the temperature of air flowing through indirect heat exchanger.

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7.       The method according to claim 6 wherein:

the step of pumping water consists of mixing water from the first outlet of the water cooling tower and the second outlet of the water cooling tower for delivery at a controlled temperature to the coil of the indirect heat exchanger.

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8.       The method according to claim 6 wherein:

the step of pumping water comprises pumping a stream of water from only one of said first outlet and said second outlet of said water cooling tower at a variable rate to the coil of the indirect heat exchanger, the stream of water being pumped at a fixed rate to a mixing valve and returned

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at a variable rate from a mixing valve to an inlet to a pump used in pumping water.

9. The method according to claim 8 and further comprising:  
5 delivering air from the blower to a second indirect heat exchanger in indirect heat exchange relationship with a coil and a second indirect heat exchanger before delivering air from the blower to the manifold; and  
10 passing water from the water cooling tower to the coil of the second indirect heat exchanger and indirect heat exchange relationship with air flowing through the second indirect heat exchanger.

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